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Supplement of

Radiative forcing due to shifting southern African fire regimes

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S1. BA change

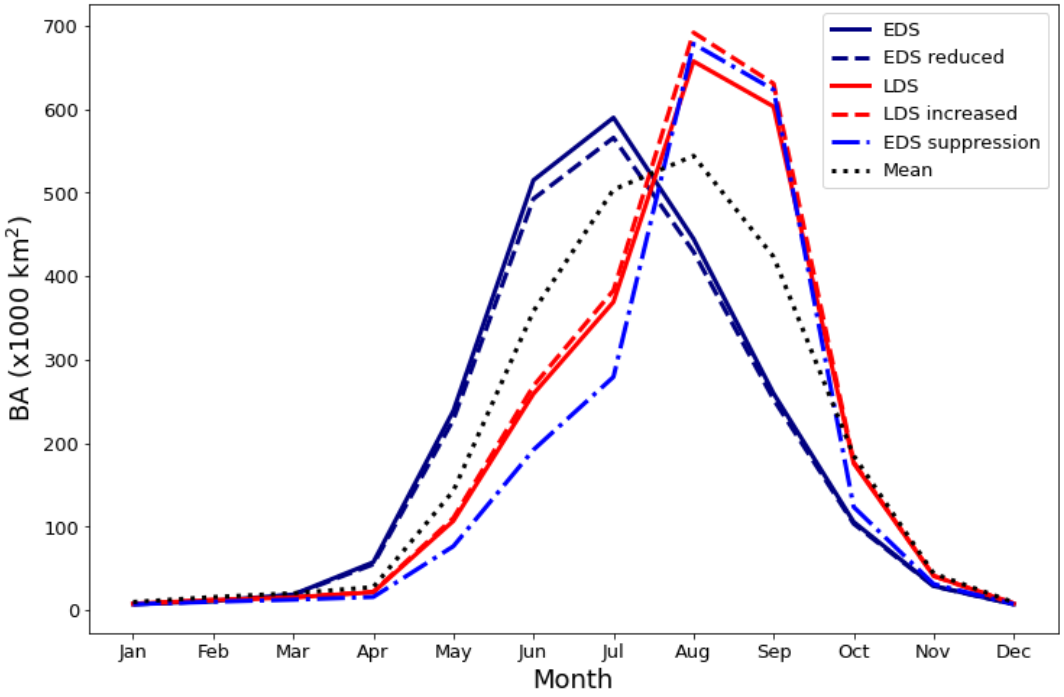

Figure S1. Monthly burned area (1000 km^2) for the study domain, with the different scenarios displayed by the colored lines.

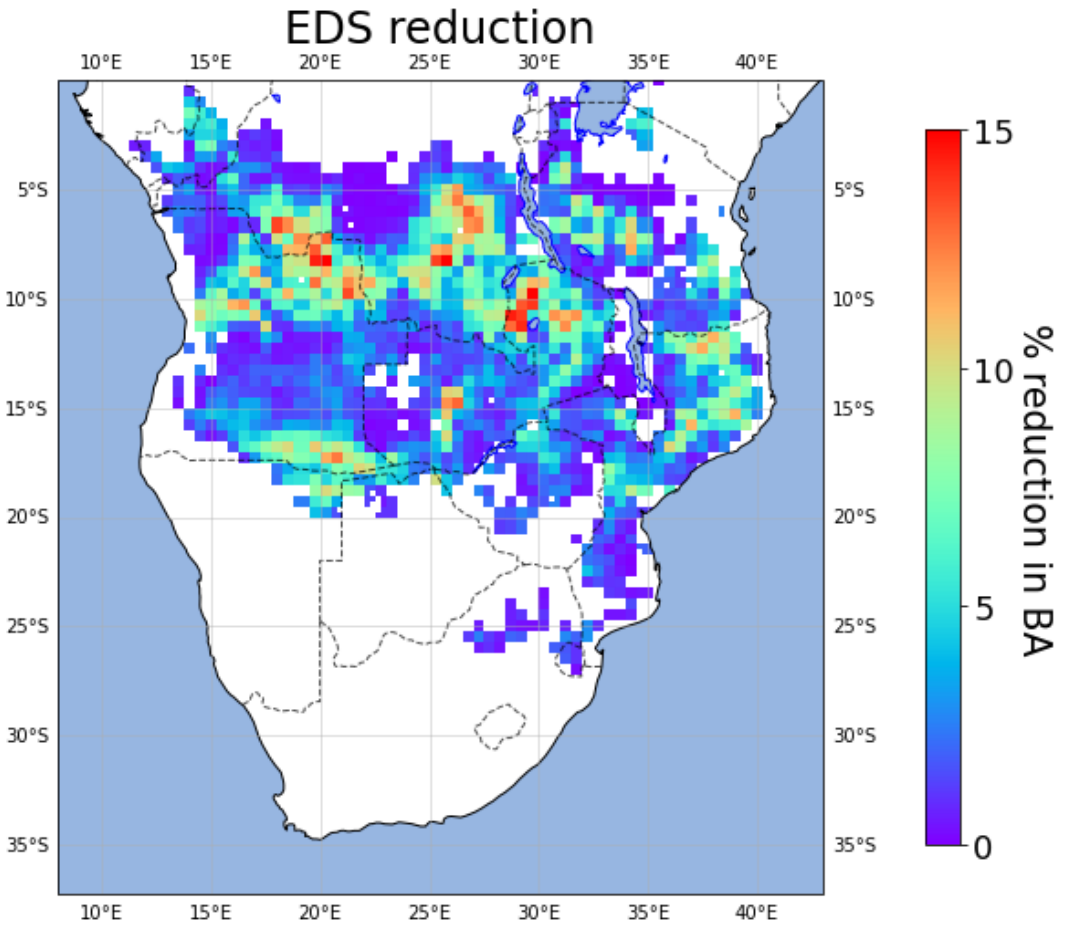

Figure S2. Spatial representation of relative BA reductions (%) in EDS reduction scenario.

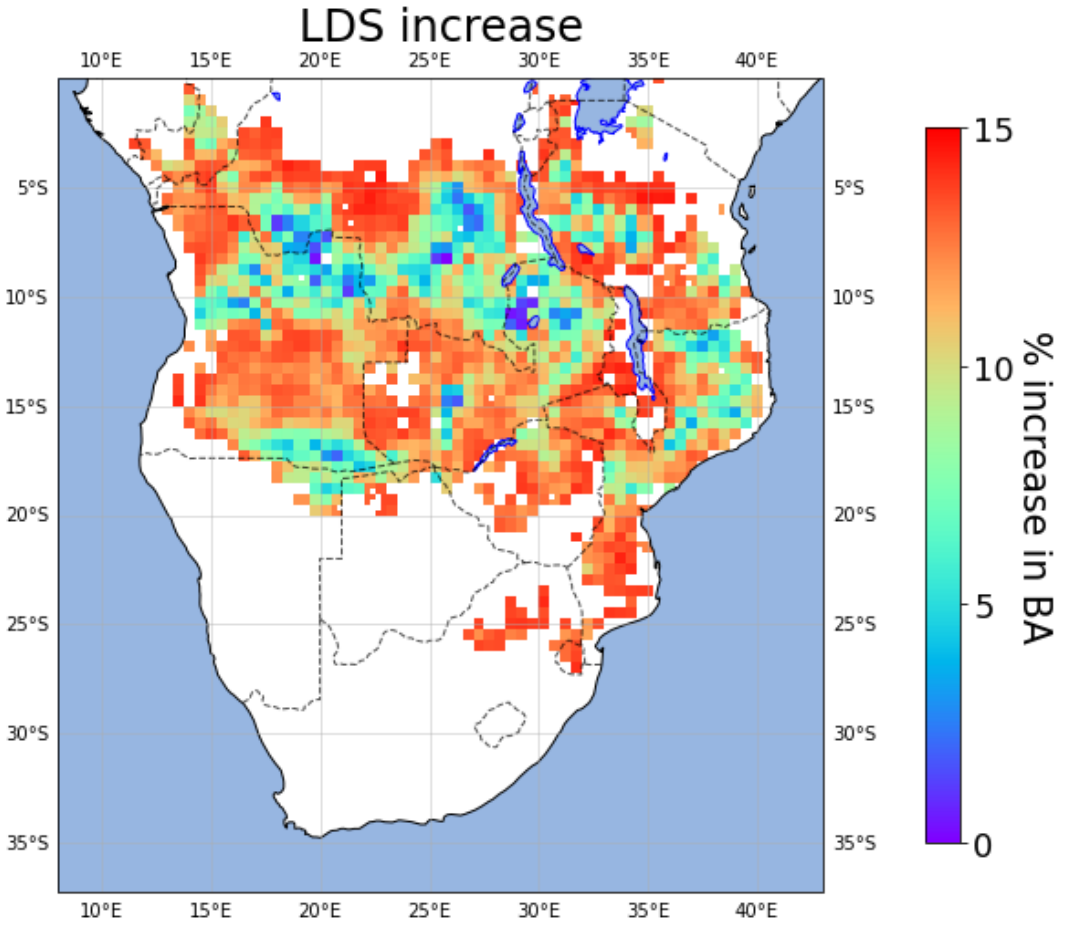

Figure S3. Spatial representation of relative BA increases (%) in LDS increase scenario.

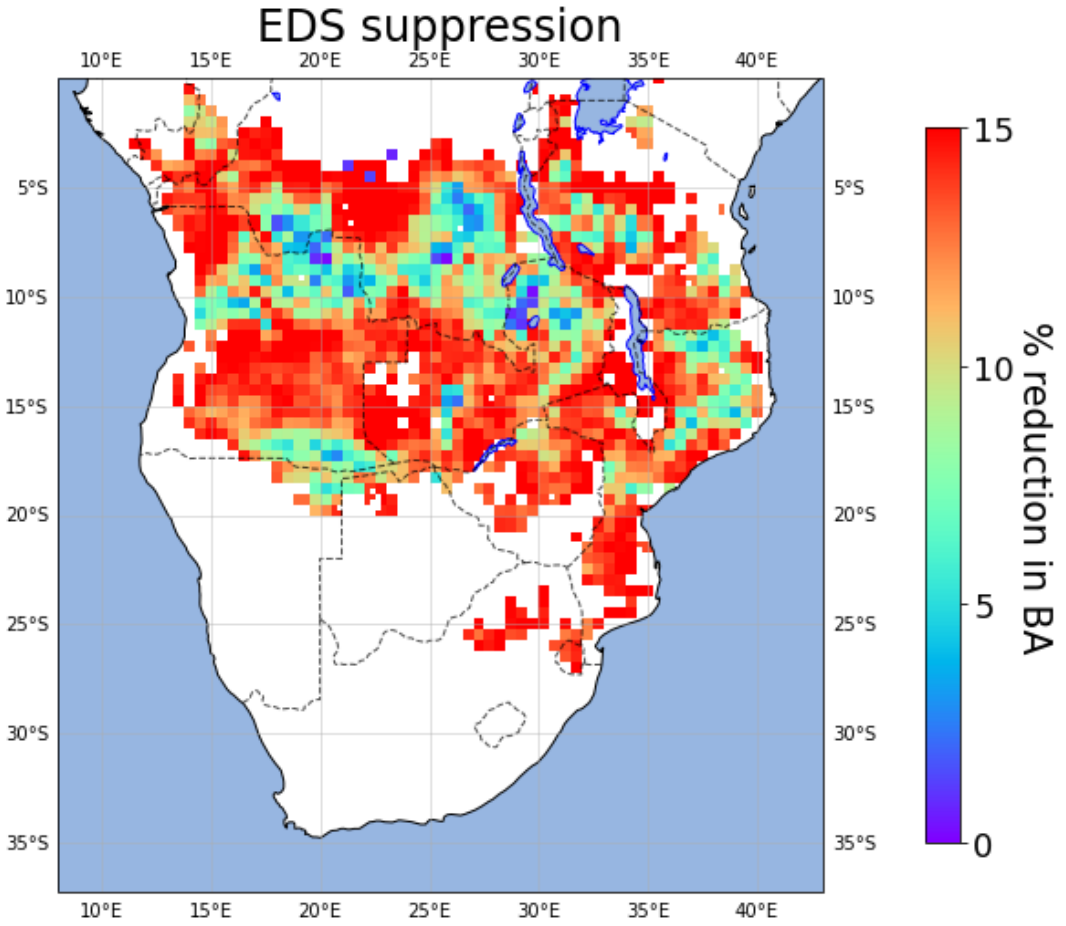

Figure S4. Spatial representation of relative BA reductions (%) in LDS suppression scenario.

S2. Transition dates and late season burn fraction

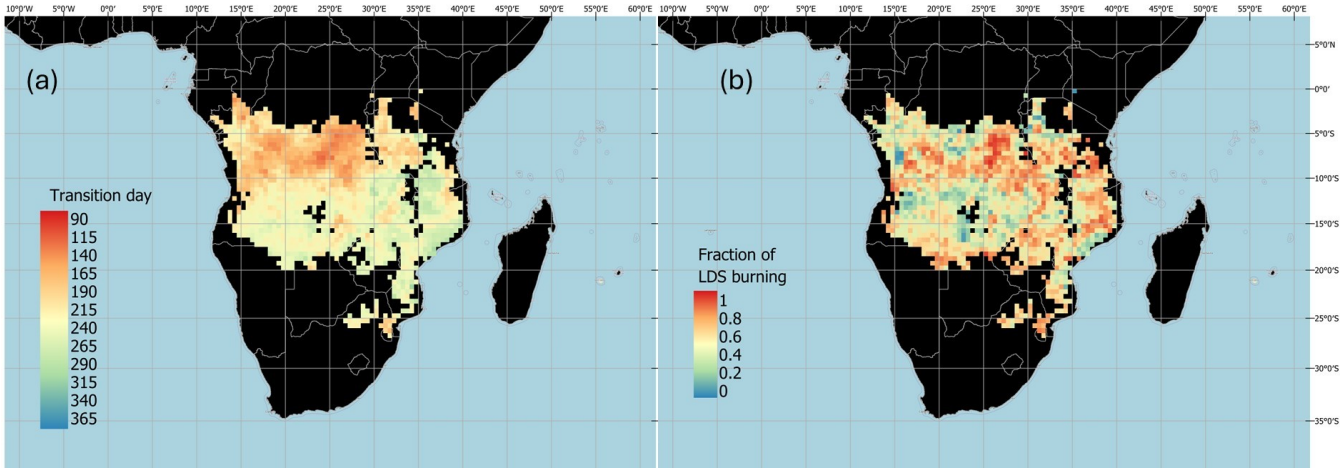

Figure S5. Individual grid cell (a) mean transition day of the calendar year and (b) fraction of burning occurring after this transition date. Data is adapted from Figure 6 in **?**. The combination of these two quantities and the total BA per grid cell is represented by the LSBI.

S3. WRF-Chem model parameters

Namelist option	Value	Description
dx	30000	Grid cell longitudinal resolution in m
dy	30000	Grid cell latitudinal resolution in m
e_vert	45	Number of vertical model levels
p_top_requested	5000	Pressure at the top of the model (Pa)
physics_suite	'tropical'	Option for default physics settings, configured to a tropical environment.*
mp_physics	10	Morrison 2-moment microphysics scheme (**?**)
cu_physics	3	Grell-Freitas GD scheme for cumulus parameterisation (**?**)
cu_rad_feedback	.true.	Feeback from cloud scheme to radiation scheme on
ra_lw_physics	4	RRTMG radiative forcing scheme for long-wave (**?**)
ra_sw_physics	4	RRTMG radiative forcing scheme for short-wave (**?**)
icloud	1	Xu-Randall method for cloud fraction profile (**?**)
grid_fdda	1	Grid analysis nudging turned on
chem_opt	109	RACM-MADE-VBS-AQCHEM chemistry scheme (**??**)
phot_opt	1	Madronich photolysis scheme (**?**)
emiss_opt	3	RADM2/MADE/SORGAM emissions style and speciation
emiss_inpt_opt	1	RADM2/MADE/SORGAM emissions style and speciation
gas_drydep_opt	1	Dry deposition of gas species on
aer_drydep_opt	1	Dry deposition of aerosol species on
gaschem_onoff	1	Gas-phase chemistry on
aerchem_onoff	1	Aerosol chemistry on
cldchem_onoff	1	Cloud chemistry on
wetscav_onoff	1	Wet scavenging on
aer_ra_feedback	1	Feedback from aerosols to radiation schemes on
aer_op_opt	3	Aerosol optical properties calculated from exact volume approximation
progn	1	Prognostic cloud droplet number on

Table S1. Key namelist.input options used in this study.

*individual physics options displayed in this table override this suite. If an option is not displayed, then it was kept to the default suite setting.

S4. Uncertainty

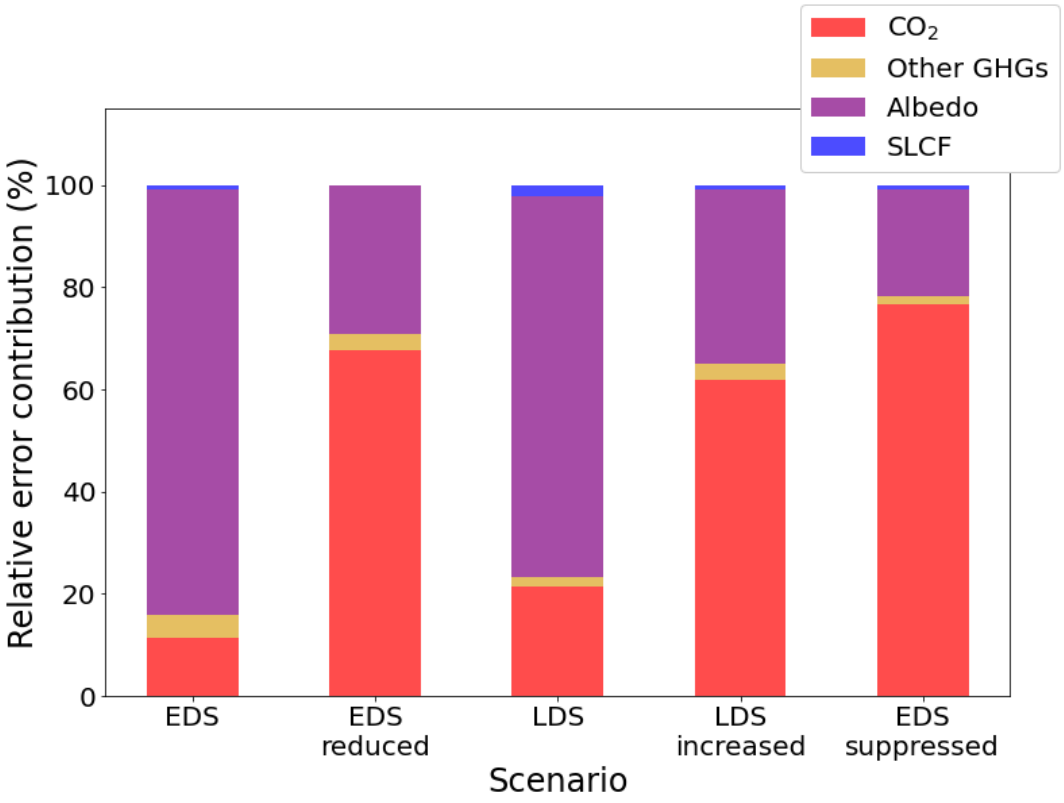

Figure S6. Relative contribution of each RF component to the total uncertainty in each scenario.

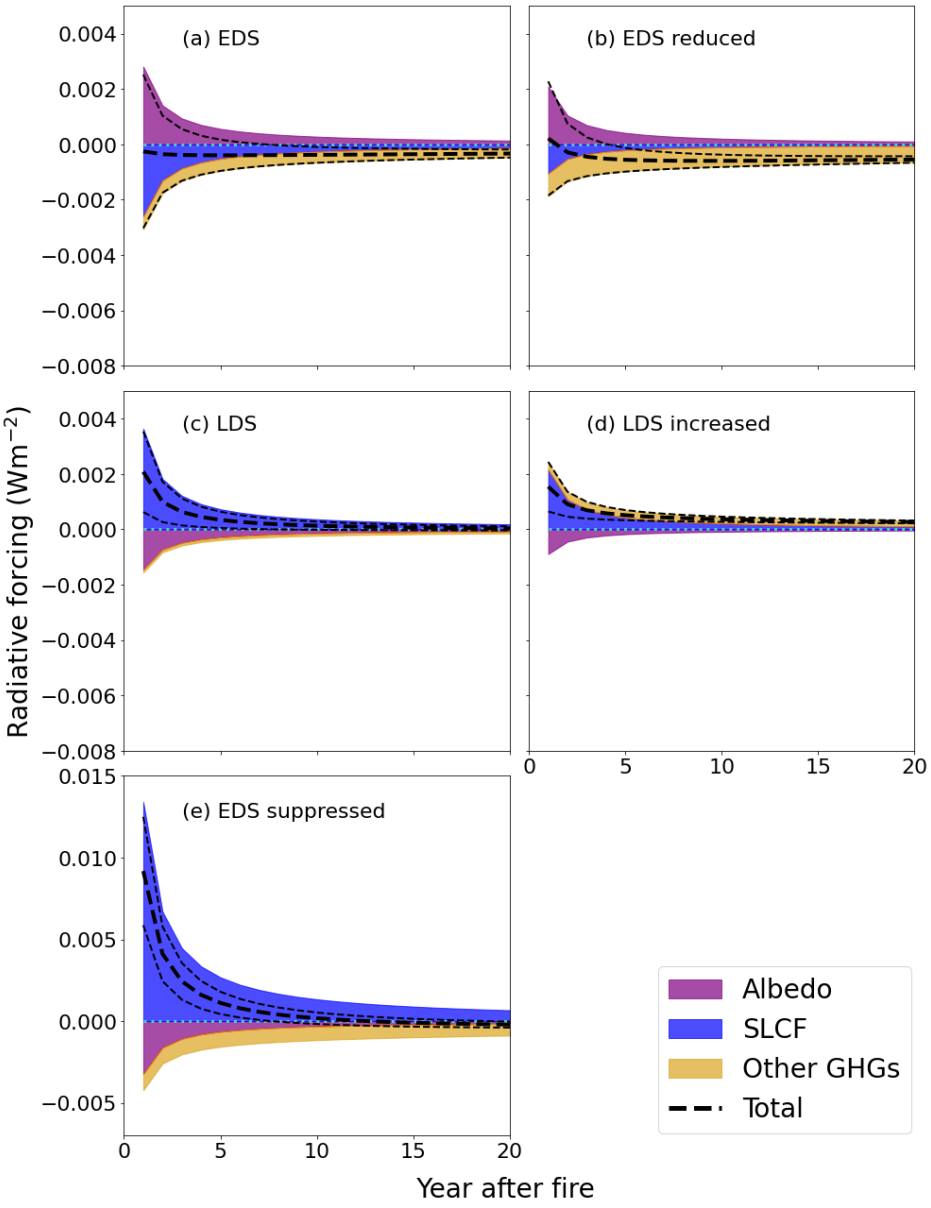

Figure S7. The same as Figure 8 in the main text, but excluding CO_2. Cumulative RF in each scenario, split into four components: Albedo (purple), SLCF (blue), and GHGs (yellow). The thick black dotted line is the sum of all the forcing components, and the thinner black dotted lines represent the upper and lower uncertainty limits. Panel (a) shows results for the EDS scenario, (b) EDS reduced, (c) LDS, (d) LDS increased and (e) EDS suppressed, over a 20-year time period. Year 0 is the year containing the fire season. Note the difference in scales between panels (a) - (d) and (e).

S5. Spatial distribution of albedo & emissions changes

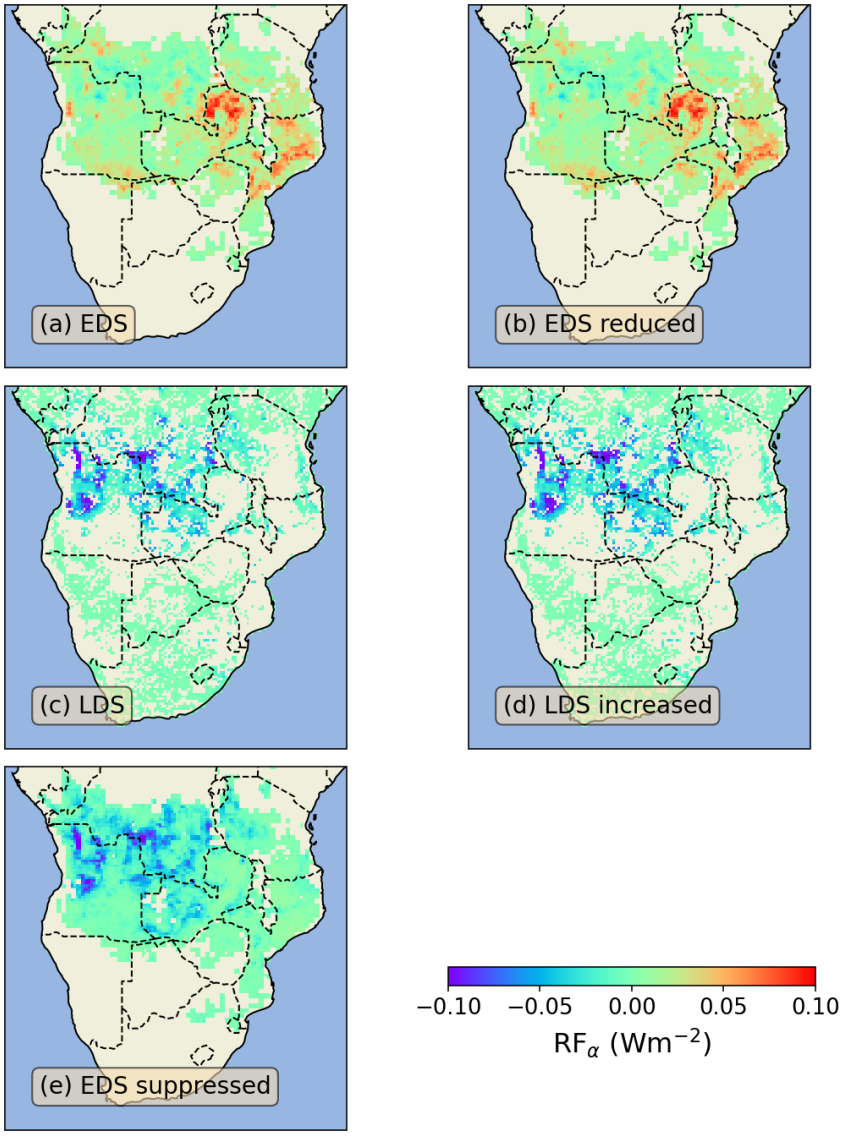

Figure S8. Spatial distribution of RF due to change in surface albedo in (a) EDS, (b) EDS reduced, (c) LDS, (d) LDS increased and (e) EDS suppressed scenarios.

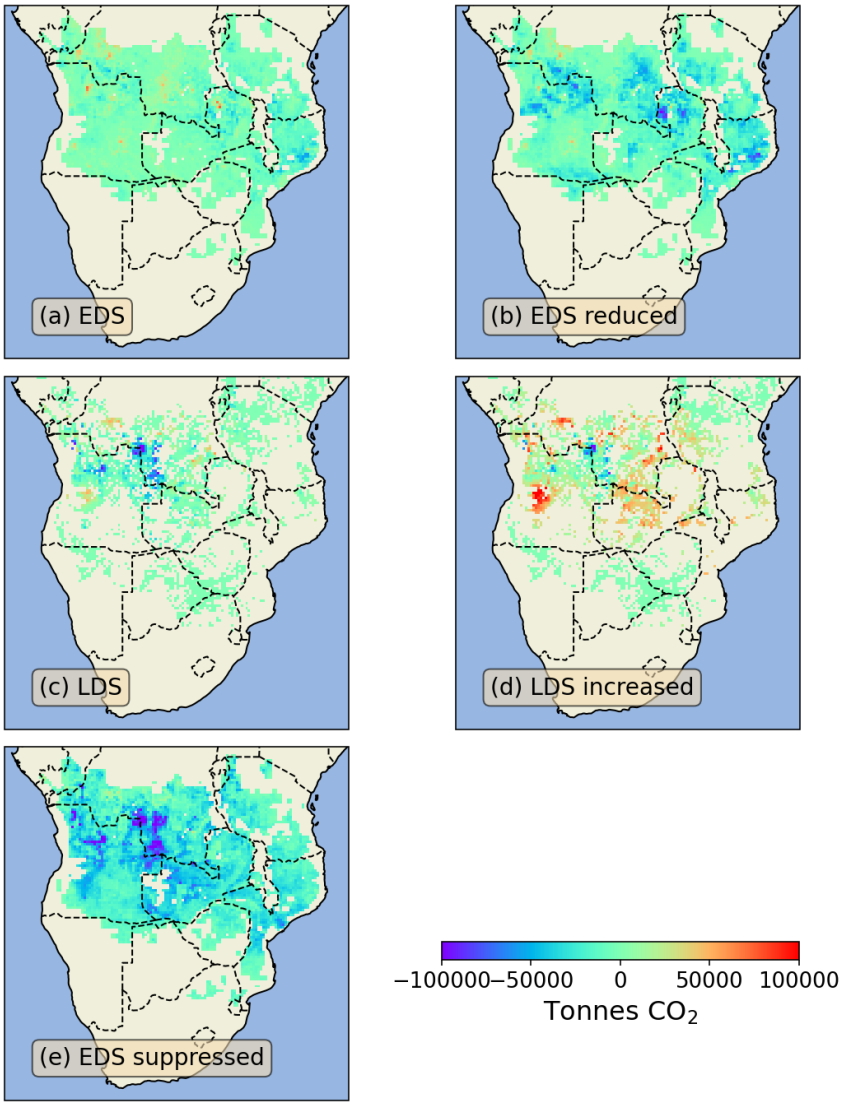

Figure S9. Spatial distribution of changes in CO_2 emissions in (a) EDS, (b) EDS reduced, (c) LDS, (d) LDS increased and (e) EDS suppressed scenarios.

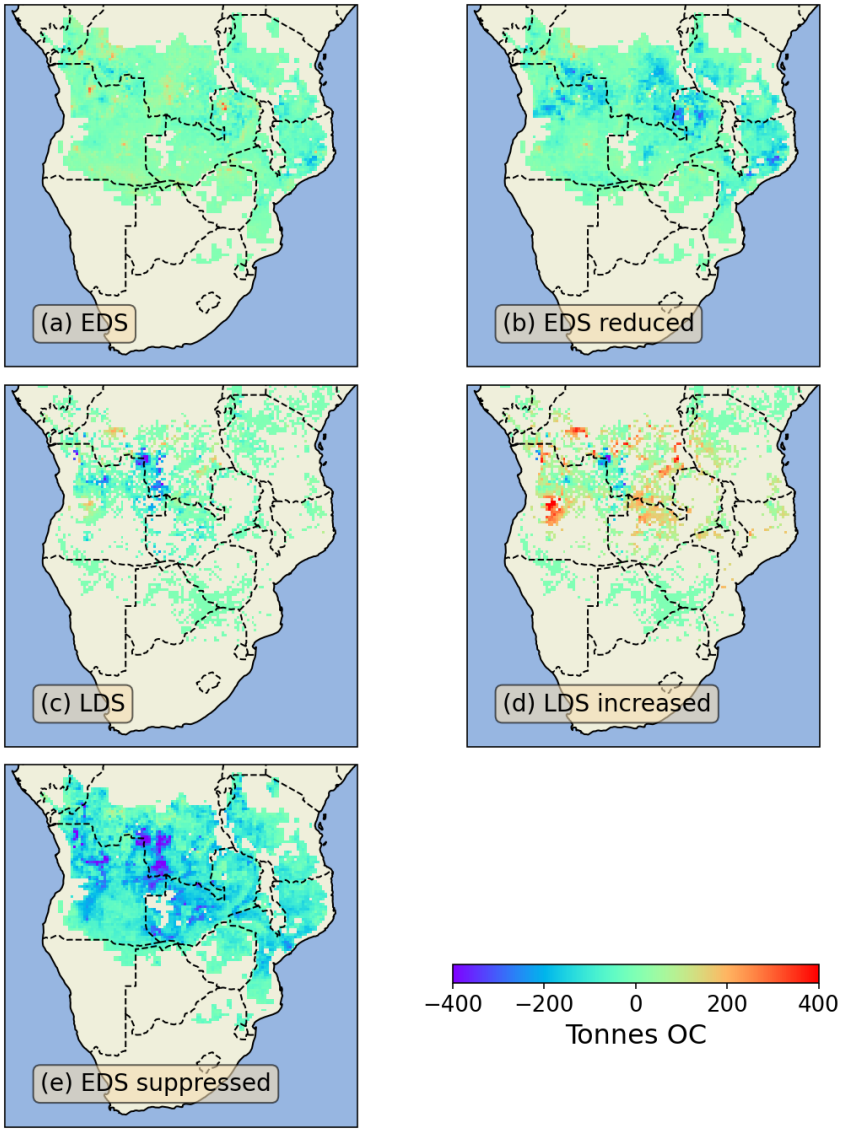

Figure S10. Spatial distribution of changes in OC aerosol emissions in (a) EDS, (b) EDS reduced, (c) LDS, (d) LDS increased and (e) EDS suppressed scenarios.